

Appendix 3

Airbus

FGSHWG Minority Opinion

The Flight Guidance Harmonization Working Group [FGSHWG] was chartered to produce proposed revisions to FAR/JAR 25.1329 and the associated AC/ACJs. The FGSHWG has made a best effort attempt to reach consensus on all issues. This document identifies a Minority Opinion that has been expressed following the consensus building process.

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Summary of Issue:

New standard for FGS emphasizes the need for a warning in case of Autopilot volunteer disengagement by the crew. It also states that this warning should only be canceled after a second crew action.

The need for a warning to cover Autopilot disengagement not triggered by the crew (Autopilot internal monitoring, failures, ...) is commonly agreed. But the recommendation to activate the very same warning at each Autopilot volunteer disengagement does not seem commensurate with the need.

Rule or AC/ACJ Reference(s):

AC/ACJ 25.1329 § 8.2.2.1

Discussion:

The new standard offers some advantages from a pure engineering point of view: a simple and single implementation can cover all cases of AP disengagement. So the issue here is not driven by feasibility or development considerations. The issue that we foresee is from the cockpit perspective and its every day operational use:

The aural alert associated to AP failure should be an aggressive sound. Its activation at each volunteer Autopilot disengagement will contribute to a noisier cockpit, and can generate a burden, typically in approach when coming in the middle of Radio Altitude call-outs or Air Traffic Control landing clearances.

The nuisance rate, i.e. the ratio between warnings triggered by volunteer and conscious disengagement in every day flight, and warnings triggered by undue activation of the Instinctive Disconnect Pushbutton will be very high. There is a risk to train the crew with the reflex action to click or double-click on the Autopilot Instinctive Disconnect just to kill the warning thus compromising crew awareness and warning efficiency the day it will be needed. The fact is that in case of Autopilot volunteer disengagement this warning is unique: All the aircraft systems are healthy!

It is understood that the need is :

- to alert the crew of an undue activation of the Autopilot instinctive disconnect
- to ensure Pilot Not Flying awareness of Pilot Flying action.

One can imagine future design responding to these needs without the activation of a warning.

Recommendation:

It is suggested to adopt a more flexible wording for JAR/FAR 25.1329 and AC/ACJ 25.1329 § 8.2.2.1, to describe the need and the safety concern rather than to prescribe a solution, in order to allow crew awareness of AP volunteer disengagement by alternate means to an aural warning:

- JAR/FAR 25.1329

(j) Following disengagement of the autopilot, a visual and/or aural ~~warning~~ **alert** must be provided to each pilot and be timely and distinct from all other cockpit ~~warnings~~ **alerts**.

- AC/ACJ 25.1329

8.1.2.1 Autopilot Disengagement Alerts

Since it is necessary for a pilot to immediately assume manual control following **automatic** disengagement of the autopilot (~~whether manual or automatic~~), a visual and aural warning must be given. This warning must be given without delay, and must be distinct from all other cockpit warnings. The warning should continue until silenced by one of the pilots using:

- an autopilot quick disengagement control
- reengagement of the autopilot
- another acceptable means.

It must sound for a minimum period, long enough to ensure that it is heard and recognized by that pilot and by other flight crew members, but not so persistent that it adversely affects communication between crew members or is a distraction.

Manual disengagement of the autopilot should cause an alert to be issued to ensure PNF awareness. This alert may be a caution, or a warning if the applicant chooses to implement a common design for both manual and automatic disengagement.

Disengagement of an autopilot within a multiple-autopilot system (e.g., downgraded capability), requiring immediate flight crew awareness and possible timely action, should cause a Caution level alert to be issued to the flight crew.

Disengagement of an autopilot within a multiple-autopilot system, requiring only flight crew awareness, should cause a suitable advisory to be issued to the flight crew.